

18. (ONCE AMENDED) An organic electroluminescence display device comprising:
a pair of electrodes; and
an organic layer formed between the pair of electrodes, the organic layer comprising a material formed of:
an aryl group, and
spirofluorene groups on at least one side of the aryl group.

21. (ONCE AMENDED) The organic electroluminescence display device of claim 18, further comprising t-butyl in the spirofluorene groups.

REMARKS

INTRODUCTION:

Claims 1-4, 8-14, and 18-21 are pending in the Office Action. Claims 1, 3, 4, and 8-10 are allowed. Claim 2 is objected to; claim 2 has been amended. Claims 11-14 and 18-21 are rejected. Claims 5-7, 15-17 and 22-24 are withdrawn from consideration.

In accordance with the foregoing, claims 2, 11, 14, 18, and 21 have been amended. No new matter is being presented, and approval and entry are respectfully requested.

ELECTION OF SPECIES RESTRICTION:

The Examiner withdrew claims 5-7, 15-17 and 22-24 and entered a final election of species restriction so that only claims 1-4, 8-14 and 18-21 are being examined in this application.

ALLOWED CLAIMS:

Claims 1, 3-4, and 8-10 were allowed.

PRIORITY DOCUMENT:

As shown on the copy of the stamped postcard, a ribboned copy of the priority document was submitted on May 23, 2001. Also enclosed are a copy of the letter "SUBMISSION OF CERTIFIED COPY OF PRIOR FOREIGN APPLICATION IN ACCORDANCE WITH THE REQUIREMENTS OF 37 C.F.R. § 1.55" and a copy of the Korean Industrial Property Office letter certifying that the ribbon copy is a true copy. Please advise if further clarification is needed.

CLAIM OBJECTION:

Claim 2 was objected to because "anthracene" was misspelled. Claim 2 has been amended to correct the misspelling. Thus, claim 2 is now in a form to be allowed.

REJECTION UNDER 35 U.S.C. § 112, second paragraph:

In the Office Action, at page 3, claims 12 and 19 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because there is no definition or explanation of how the spirofluorene groups are perpendicular.

It is respectfully submitted that it is known to those skilled in the art that conjugated oligomers are characterized by structural uniformity, absence of chain defects, and ease of purification and characterization. Compared with polymers, oligomers generally have more predictable and reproducible properties. In a spirobifluorene, two spiro-linked fluorene units have been shown to be oriented at 90° with respect to each other. Thus, it is known that spirofluorene groups are perpendicular. Hence, it is respectfully submitted that no further explanation is necessary. Thus, claims 12 and 19 are definite and in a form to be allowed.

In the Office Action, at page 3, claims 13 and 20 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because there is no definition of the spirofluorene groups and anthracene being distorted in the specification.

It is respectfully submitted that it is known to those skilled in the art that it has been shown that absorption and photoluminescence spectra in dilute solutions are not affected by a pendant's chain length for spiro-oligo(fluorene)s, suggesting that there is a constant torsion angle between neighboring fluorene units within conjugated segments. Thus, when anthracene is located at a center of a molecule and spirobifluorene units are located on both ends, the torsion angle limits the amount of space available for reaction, and when a reaction does take place, steric hindrance occurs due to the predetermined torsion angle, and slight distortion of the anthracene and the end units may occur due to the proximity of the end groups. Hence, it is respectfully submitted that it is not necessary to define the distortion of the spirofluorene groups and the anthracene, and that claims 13 and 20 are in a form to be allowed.

In the Office Action, at page 3, claims 14 and 21 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because it was unclear whether the t-butyl group is located on the aryl groups or the spirofluorene groups.

It is respectfully submitted that in paragraph 29, lines 1-2, the specification states: "The Ar in the formula 1 may be represented in a following formula 2, and R₁ and R₂ may be t-butyl." Thus, as shown in formula 1 (paragraph 23, page 5 of the specification) it is clear that t-butyl is a functional group, i.e., a pendant group, on a spiro-oligo(fluorene). Claims 14 and 21 have been amended to show more clearly that the t-butyl is located in the spirofluorene groups. Hence, it is respectfully submitted that amended claims 14 and 21 are clear and in a form to be allowed.

REJECTION UNDER 35 U.S.C. § 103:

In the Office Action, at page 3, claims 11 and 18 were rejected under 35 U.S.C. § 103 (a), as being unpatentable over Kreuder et al. (hereafter, Kreuder), U.S. Patent No. 5,763,636. This rejection is traversed and reconsideration is requested.

Claims 11 and 18 have been amended to recite that the spirofluorene groups are "on at least one side of the aryl group." As admitted by the Examiner, the Kreuder reference does not specifically disclose that there is more than one spirofluorene group as per instant claims 11 and 18. The Examiner suggests that it would have been obvious to utilize a plurality of spiro centers as electroluminescence materials. However, the Examiner fails to cite a reference that teaches or suggests using more than one spiro center. There is no teaching or suggestion that using more than one spiro center as electroluminescence materials would be adaptable to providing a desirable effect, or even whether, chemically, a desired effect would be attained by using a plurality of spirofluorene groups. Accordingly, Kreuder fails to teach or suggest all the claim limitations of claims 11 and 18 and the claims from which they depend, respectively.

It is respectfully submitted that the Examiner may not suggest modifying the references using the present invention as a template absent a suggestion of the desirability of the modification in the cited art. *In re Fitch*, 23 U.S.P.Q. 2d 1780 (Fed. Cir. 1992). Thus, it is respectfully requested that claims 11 and 18 be allowed.

Since claim 11 is allowable and claims 12-14 depend therefrom, claims 12-14 are allowable for at least the reasons that claim 11 is allowable. Since claim 18 is allowable and claims 19-21 depend therefrom, claims 19-21 are allowable for at least the reasons that claim 18 is allowable.

Thus, in view of the above, it is respectfully asserted that claims 1, 3-4 and 8-10 have been allowed, and claims 2, 11-14 and 18-21 are in form to be allowed.

CONCLUSION:

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot, and further, that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance, which action is earnestly solicited.


If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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Date: 2/6/03

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VERSION WITH MARKING TO SHOW CHANGES MADE

IN THE CLAIMS:

Please **AMEND** claims 2, 11, 14, 18, and 21 as follows:

2. (ONCE AMENDED) The blue electroluminescence compound of claim 1, wherein the Ar is a functional group selected from the group consisting of [anthracene] anthracene, naphthalene, and a phenyl group in the formula 1.

11. (ONCE AMENDED) An organic electroluminescence compound comprising:
an aryl group; and
spirofluorene groups on at least one side of the aryl group.

14. (ONCE AMENDED) The organic electroluminescence compound of claim 11, further comprising t-butyl in the spirofluorene groups.

18. (ONCE AMENDED) An organic electroluminescence display device comprising:
a pair of electrodes; and
an organic layer formed between the pair of electrodes, the organic layer comprising a material formed of:
an aryl group, and
spirofluorene groups on at least one side of the aryl group.

21. (ONCE AMENDED) The organic electroluminescence display device of claim 18, further comprising t-butyl in the spirofluorene groups.